CHAPTER 7

SILVICULTURAL CHEMICAL TREATMENT

Silvicultural Chemical Treatment

Fertilizer, Herbicides and Pesticides

Chemicals are used to control or prevent damage by insects, disease, unwanted vegetation, rodents, or birds to a forest or to individual trees within a forest. The target pests to be controlled will vary with stand age, species, site conditions, stand density, or market goals for the stand. The purpose for including a section on chemicals is to prevent the contamination of surface waters or ground water by pesticides that are used for forestry purposes.

General Conditions Where Practice Applies

Pesticides are used to protect the landowner's investment from loss due to pests. Herbicides are used to selectively remove certain plants from competition with those designated for the site.

The conditions for the appropriate handling of forest chemicals in order to protect water quality are the focal concerns of this chapter.

Pesticides/Herbicides may be used with different goals throughout the life of a stand. The following are possible applications of forest pesticides/herbicides:

1. The control of insects or grubs that will attack young seedlings.
2. Pesticides may be applied to seeds used for direct seeding to repel insects, mammals and birds.

3. Seedlings may be dipped in pesticides to repel insects and herbivores that might attack the young seedling.

4. Sapling stands may be treated with pesticides when they are short-rotation, high-value stands, such as Christmas trees, or to control an infestation that is likely to spread.

5. Both immature and mature trees may be treated with pesticides to reduce the effects of outbreaks of insect damage beyond the levels normal to the forest. High-value trees may be individually treated to preserve their potential value.

6. Dead or dying trees may be treated with pesticides to stop the spread of the insect or disease.

7. Herbicides may be used when a change in the composition of the existing forest is desired and herbicides will be less expensive or easier to apply than other measures, and their use will safely achieve the desired results.

8. Herbicides can be used for site preparation with or without the use of fire and can duplicate or surpass mechanical site preparation results with less water quality impact. Soil is undisturbed so slope is not the limiting factor as it is with mechanical site preparation.

9. Herbicides may also be used to control unwanted vegetation in established stands.

Planning Considerations

Pesticides and herbicides can be liquid, granular or powder and can be applied aerially or by ground equipment. Water quality considerations include measures taken to keep pesticides and herbicides from reaching streams whether by direct application or through runoff of surface water. Applications must follow manufacturers' label instructions, EPA guidelines, regulations pursuant to the Virginia Pesticide Control Act, and DOF aerial spray guidelines (when spraying under a DOF aerial spraying contract).

Pesticides and herbicides vary widely in toxicity and persistence. Caution in their use is always essential. Excessive applications and misuse are the most immediate problems. Expert advice is available from the Department of Forestry.

Pesticides and herbicides that have been designated "Restricted Use" by the Environmental Protection Agency require application by or under the supervision of applicators certified by the Virginia Department of Agriculture Pesticide Board. Information on the certification process is available from the Virginia Department of Agriculture and Consumer Services.

1. Proper Application of Pesticides

   Many pesticides and herbicides must be used by or under the direct supervision of a State Certified Pesticide Applicator.

   Potential for adverse water quality impact varies widely from one chemical to another and depends primarily on: (1) the chemical's mobility; (2) its persistence; and (3) the accuracy of its placement. Water quality can be protected by knowledge of the chemical being used and adherence to the manufacturer's specification and directions. The label contains information regarding the safety of the applicator, target species for which the chemical is registered, the pesticide/herbicide application rate or concentration, appropriate weather conditions during application, environmental impact, and proper container disposal. Material Safety Data Sheets provide toxicological data and are available from the chemical manufacturer.

   Each pesticide or herbicide application project will have its own unique considerations but the following are general guidelines that should be followed:

   A. Pesticide and herbicide applications should be scheduled when atmospheric conditions will assure that the pesticide/herbicide reaches the target species. Application in advance of and during unstable and unpredictable changing weather patterns should be avoided.

   B. Aerial Applications will not be made when surface wind speeds exceed 5 miles per hour or when there is danger that the pesticide/herbicide will be displaced by wind. *In no case shall application be made under windy or gusty conditions*.

   C. Filter and buffer strips must conform to federal and state regulations and any label requirements. The use of aerial or broadcast application of herbicides is not allowed in any SMZ adjacent to perennial streams. (See SMZ section of this Manual.) Buffers and filter strips should be considered next to agricultural crops, farm animals, orchards, apiaries, horticultural crops, etc.

   D. The use of persistent, bioaccumulating pesticides should be avoided as much as possible. Virginia Department of Forestry personnel can assist in determining the optimum chemical to use.

   E. The use of granular pesticides and herbicides, preplant treatments and injection methods are preferred because of the reduced likelihood of water pollution. Pesticides and herbicides with low solubility in water are less likely to cause water pollution through drainage and runoff than pesticides/herbicides with high water solubility. Pesticides and herbicides with low solubility often adhere strongly to sediment particles and the loss of these pesticides/herbicides can be greatly reduced by preventing erosion.

F. Pesticides and herbicides should not be mixed and application equipment should not be filled, emptied or repaired where spilled chemicals can drain or be washed into streams, lakes or other bodies of water.

G. Equipment and techniques that are designed to assure maximum control of the spray swath with minimum drift will be used.

H. *Under no circumstances will silvicultural pesticides, herbicides or fertilizers be applied to the surface of lakes, ponds or streams as part of a practice to establish stands of trees.*

I. Transportation regulations for pesticides and herbicides must be followed. Accidents that result in spillage must be reported promptly to the proper authorities.

2. Proper Disposal of Pesticides and Herbicides

A careful evaluation of pesticide/herbicide needs should be made in advance and purchases limited to a one-year or one-season supply. This will reduce carryover, damaged containers, and diminished effectiveness of the pesticide or herbicide. Another consideration should be to mix only the amount of pesticide/herbicide needed for the job at hand in order to end the application with an empty tank or hopper. Unwanted pesticides/herbicides should never be disposed of in a manner inconsistent with the product label.

3. Proper Disposal of Containers

No pesticide/herbicide container is ever truly empty–*all contain residues*. Disposal of pesticide and herbicide containers must be in accordance with label directions.

Containers should be allowed to drain in a vertical position for 30 seconds after normal emptying. The container should then be rinsed three times with water or other diluting material, allowing 30 seconds for draining after each rinse. A good rule of thumb is to refill the container 1/4 to 1/5 full for each rinse; e.g., use one quart of water or diluting material for each gallon container; one gallon for 5-gallon containers; and five gallons for 30- or 55-gallon drums. Each rinse should be drained into the spray tank.

Pesticide and herbicide containers should not be reused even after the triple rinse procedure has been completed.

Any specific disposal directions or procedures on the product labels must be carefully followed.

Disposal of containers should be supervised by someone qualified and licensed for the application and handling of pesticides/herbicides. The disposal of the containers is as much a part of proper handling as is the application of the chemical to the target area.

4. Forest Fertilization

The application of nitrogen, phosphorus or other elements by conventional ground equipment, helicopter or fixed wing aircraft is to enhance the growth of tree species. Ammonium nitrate is known to be toxic to fish and shellfish, and phosphorus is known to be responsible for the acceleration of the oxygen depletion process in water bodies.

A. Fertilizer may be broadcast no closer than 100 feet from open water or perennial streams.

B. Application of fertilizer mixtures should be at rates reflecting tree species and soil needs.

C. Application must be made according to the manufacturer's label instructions.

D. Loading and unloading operations should occur away from ditches and waterbodies.

5. Sources of Advice

Landowners should consult the Virginia Department of Forestry. Technical advice on pesticide use is available from the Virginia Cooperative Extension Service, the Environmental Protection Agency (EPA), and the chemical manufacturer. Advice on the disposal of pesticides/herbicides and containers is available from the same sources, from the Virginia Department of Health, and from the Virginia Department of Agriculture and Consumer Services (VDACS). VDACS administers the examination and certification of applicators.

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